Remarks/Arguments

Claims 1, 3-5, 7-12, 14-15 and 18 are pending in this application. Claim 10 has been cancelled, and claim 31 is new.

Rejection of Claims 1, 3-5, 7-12, 14, and 15 under 35 U.S.C. §102(b) and claims 16 and 18 under 35 U.S.C. §103(a)

The present invention is directed to an apparatus for the application of bone cement which contemplates direct displacement of the liquid cement in a short period, where such rapid displacement of the liquid cement creates a strong counter pressure. When the counter pressure becomes so large that it cannot be overcome by direct displacement, the piston is then switched to the mode of "displacement of the piston by screw movement." The present invention as now claimed is directed to switching from a "direct displacement" to a "displacement of the piston by screw movement" using a ***cooperating toothed arrangement*** provided at the housing such that the longitudinal displacement is effected when the engaging section is turned. The cooperating toothed arrangement can be moved ***perpendicular*** to the direction of displacement of the piston via a fast and simple switch on the handle. The present invention as now claimed provides the advantage of stabilizing the apparatus where the screw movement can be utilized to manually operate the piston to overcome the great pressure exhibited by the hardening of the bone cement.

Claims 1, 3-5, 7-12, 14 and 15 are not anticipated by Kokernak (U.S. 4,583,974)

The Examiner rejected claims 1, 3-5, 7-12, 14 and 15 under 35 U.S.C. 102(b) as anticipated by Kokernak. Kokernak is directed to syringe for inflation of balloon catheters. Kokernak does not teach an apparatus using a cooperating toothed arrangement where the screw thread or teeth (p. 7, lines 30-32) are formed to extend substantially perpendicular to the longitudinal axis of the piston. Kokernak does not describe teeth having a part-annular shape in cross-section to yield an enlarged contact region with respect to the screw thread to avoid damage during high pressure procedures. In this invention, the high pressure forces created between the teeth and screw threads during the screwing of the piston are fully absorbed without a force component acting on the flanks in a direction perpendicular to the longitudinal axis which could effect a displacement of the locking element against the force of the spring. As a

result, an unwanted uncoupling of the locking element from the shaft is thus excluded even when a very high pressure arises. Secondly, the teeth are formed in part-annular shape in cross-section and thus create an enlarged contact region with respect to the screw thread. This avoids the breaking of the teeth or screw threads. Kokernak does not describe the use of a cooperating toothed arrangement in the claims or specification.

Claims 16 and 18 are not obvious by Kokernak (U.S. 4,583,974) in view of Jacoby, Jr. (U.S. 2,711,733)

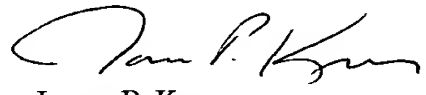
The Examiner rejected claims 16 and 18 under U.S.C. 103(a) as obvious by Kokernak in view of Jacoby, Jr. This invention teaches the use of a cooperating tooth arrangement under high pressure conditions, and neither Kokernak nor Jacoby, Jr. disclose such an apparatus. Kokernak is directed to a syringe for inflation of balloon catheters under low pressures. Jacob, Jr. is directed to a syringe or cannula for injecting liquid. Jacoby, Jr. does not describe or suggest moving the plunger by a screw movement in a situation under high pressure conditions. Moreover, Jacoby, Jr. does not disclose using a cooperating toothed arrangement apparatus or a screw movement for displacing the liquid.

Conclusion

Kokernak teaches a syringe for the inflation of balloon catheters. Kokernak is directed to a syringe for inflation of balloon catheters under low pressures. The present invention is directed to an apparatus for the application of bone cement which contemplates direct displacement of the liquid cement in a short period, where such rapid displacement of the liquid cement creates a strong counter pressure. The present invention is directed to an apparatus for switching from a "direct displacement" to a "displacement of the piston by screw movement" using a cooperating toothed arrangement provided at the housing such that the longitudinal displacement is effected when the engaging section is turned. The cooperating toothed arrangement can be moved ***perpendicular*** to the direction of displacement of the piston via a fast and simple switch on the handle. This invention offers the advantage of stabilizing the apparatus where the screw movement can be utilized to manually operate the piston to overcome the great pressure exhibited by the hardening of the bone cement.

In view of the foregoing, Applicant respectfully requests the passage of the application to issue. The Commissioner is hereby authorized to charge any additional fees which may be required in this application to Deposit Account No. 06-1135. In the case of overpayment, please credit the same account.

Respectfully submitted,
FITCH, EVEN, TABIN & FLANNERY

By 
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